Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

further than for a teleological explanation of biological phenomena. Weismannism was much attacked and much mended. Cope issued several articles foreshadowing his now well-known book. Whitman showed from the history of the discussion, epigenesis *vs.* evolution, how the grounds of debate have completely changed.

In glancing over the work of the year, we see that the great advances were made in cytology in the broad sense, in the interpretation of the causes of the early ontogenetic changes, in the general physiology of organisms, in the experimental determination of form and in the quantitative study of variation. All of these are subjects little considered a decade or two ago. It is noticeable also that, although general biology has long been regarded as a free field for all speculators, the greatest activity among workers and the richest results are found when the students of fact are busy. This is the most hopeful sign for the future.

THE SWAMPS OF OSWEGO COUNTY, N. Y., AND THEIR FLORA.

By W. W. Rowlee,
CORNELL UNIVERSITY, ITHACA, N. Y.

(Concluded from page 699.)

THE LAKES.

In the region of our typical swamps these lakes are frequently of considerable depth. Usually, however, they are comparatively shallow. Stories are told here, as elsewhere, of "bottomless lakes" where a line, no matter how long, would not reach the bottom. The fine mud in the bottom was, in all probability, the cause of the deception. At the bottom of the lake the mud is as mobile as water, and it is difficult to determine where fluid ends and solid begins, and hence the difficulty in sounding. There are at least three lakes in this region called Mud Lake, a fact which testifies to their character. One is Mud Lake in Oswego town already described, another is in Scriba in the same county two or three miles south of the

Lily Marsh, and the third is near Baldwinsville in Onondaga County.

The mud of the swamps gives a decided character to the streams of the region. Whether a stream rises in the lake or flows through it or any other part of the swamp, the water is colored by the mud a dark yellow or wine color. This color of the water of many of the streams led to the application of appropriate names, such as Wine Creek, Mud Creek and Black Creek.

THE LAKE FLORA.

While the flora of the lakes present many interesting features, the plants are much less unique than those of the surrounding moor. Aquatic plants have long been noted for their wide distribution. Darwin has pointed out that this depends upon the distribution of their seed by birds. While we are ready to accept this as one of the means by which the plants disseminate themselves, we must also assert that the ultimate causes of this is the similarity of conditions presented by aquatic conditions generally. The conditions are very much the same in our lakes as in other similar bodies of water, such as slow flowing streams and lakes with hard shores. Aquatic floras are, however, quite distinct from terrestrial ones of the same region. The moors surrounding our lake come very near affording aquatic conditions. Nevertheless the shore line between lake and moor is a pretty definite one. The following are species representative of the lake flora:

The *Naiadaceæ* afford a characteristic group belonging here. None of them find congenial conditions outside the bounds of the lake, and most of them are confined to water several feet deep. *Potamogeton amplifolius, P. lonchites and P. heterophyllus* are in the latter class, while *Naias flexilis* and *P. foliosus* approach nearer the shores.

Vallisneria spiralis is a plant which does not appear very near the shores.

Eleocharis mutata must be considered, at least in this region, a lake plant, as at Lake Neahtahwantah and Paddy Lake, our only stations for it, it grows only in water. It seems essential, however, that its roots only should be submerged ; the culms always appear above water, and consequently it occurs only upon rather shallow shores.

The Lemnaceæ are represented in the lakes by *Lemna trisulca, L. minor* and *Spirodela polyrhiza,* none of which make any attempt to grow in the bog.

Eriocaulon septangulare is one of the few plants that are common to the lake and the moor, in fact, it is about the only one. Whether it grows upon sand in a few inches of water, or upon the soft mud in the newest portions of the moor, it seems equally at home. I have found it growing in four lakes in the county, but never saw it in a swamp where there was no lake. Paine says (Cat. of Plants of Oneida Co.), of the distribution of this plant, " Lakes and ponds of the north woods, throughout and common." I conclude, therefore, that the plant is, in this region, a lake plant.

Heteranthera dubia is a deep water plant, and grows in these lakes as well as in slow flowing streams.

The whole order Nymphæaceæ is a water-loving group. With rare exceptions it is confined to the shallower portions of the lake. The exceptions are cases where the strong rootstock of *Nymphæa* and *Castalia* have persisted after the moor has advanced into the lake beyond them and sends up, for a few years, its leaves and flowers through the thin turf. The contrast between the black mud of the moor and the pure white flowers of *Castalia* is very striking. *Brasenia purpurea, Castalia odorata, Nymphæa advena* are the representative plants. The depth of water in which these plants grow ranges from one to six feet, only rarely going outside these limits.

Myriophyllum spicatum is a well-known aquatic finding a place here.

The Lentibulariaceæ is represented by two species in the lakes and several others in the moor. None of its species are common to both lake and moor. *Utricularia vulgaris* and *U. minor* are the lake plants. While occurring in other places, they thrive particularly well in the muddy lakes surrounded by moors.

And, finally, for the order Compositæ, we have, in our lakes, a single representative in *Bidens beckii.*

THE FLORA OF THE MOOR.

There is no group of plants more interesting from the point of view of their geographical distribution than the one which constitutes the moor flora. Allusion has already been made to the probable post-glacial history of the flora; and attention has also been called to its relation to the Alpine flora of New York State. The general fact that the two floras approach each other toward the north until we find them closely associated in Arctic regions, is pretty conclusive evidence of closer association in post-glacial times. But their limited distribution and their relation to our Alpine flora is no more interesting than their distribution in the moor itself. Some of the plants are restricted to the newer portions of the bog; others are only found in the older portions. Those of the newer portion are, in general, the invading plants; those of the older portion sometimes persist in the wooded belt. In the older portions of the bogs there sometimes appear upland plants. A general survey of the species may here be made.

The *Juncaginaceæ* are all marsh plants. In our region they are, so far as I know, mainly confined to the newer portion of the sphagnous moors. *Triglochin maritima* occurs at Mud Lake, Oswego town, " Paradise," So. Mexico, Granny's Orchard, Palermo, and other places. According to the Manual (Gray's) it occurs at the seashore and in saline places across the Continent. Mud Lake is by no means a saline place. *T. palustris* has not been seen, so far as I know, in Oswego County, but occurs at Junius, Seneca County, in the same basin, also upon the " boggy borders of Onondaga Lake; at Salina, and northward beyond Liverpool " (Paine, l. c., p. 81). *Scheuchzeria* occurs in the newer portions of all our sphagnous moors.

There are but few *grasses: Phragmites, Muhlenbergia racemosa, Panicularia canadensis* and *Calamagrostis canadensis* are frequently found in the moors, but are not confined to them.

On the other hand the *Cyperaceæ* is one of the best represented orders. Here, and here almost exclusively, the species of woolgrass (Eriophorum) grow. One of the most effective bog-making plants in this region is *Carex filiformis*, the rootstocks of which form a very strong warp into which other plants are woven. It presses up close to the margin of the lake, and affords a pretty sure indication as to whether it is safe to venture upon the place or not. Other characteristic carices are *C. pauciflora*, *C. teretiuscula*, *C. magellanica*, *C. limosa*, *C. exilis* and *C. redowskyana*. Other species of Carex, as well as some species belonging to other genera in this order, are often found in the bog.

Peltandra virginica is in the moors, but occurs as well along all our streams. Calla, while perhaps not exclusively a moor plant, occurs here more frequently than anywhere else.

But a single species of the *Liliaceæ* is found, viz.: *Vagnera trifolia.*

In distinct contrast we find this the chosen home of our rarest orchids. The representative species are: *Habenaria blephariglottis*, *H. clavellata*, *H. dilatata*, *H. leucophæa*, *Cypripedium reginæ*, *Pogonia ophioglossoides*, *P. verticillata*, *Arethusa bulbosa*, *Gyrostaichy romanzoffiana*, *Listera australis* and *Limodorum tuberosum.*

Two willows, *Salix myrtilloides* and *S. candida*, are exclusively moor plants in this region.

Sarracenia purpurea is confined to the moors, and is one of the most unique in appearance and habits of moor plants.

Drosera intermedia occurs only in the newest portions of the moor, while *U. rotundifolia* is more often in the drier portions, sometimes even growing upon rotten logs at the margin.

Three of the *Rosaceæ* are conspicuous moor plants. *Comarum palustre* is usually upon the water's edge, and is a pretty effective moor builder. The other species are *Geum rivale* and *Sanguisorba canadensis*, both of which are in the more mature portions.

Decodon verticillatus occurs in considerable abundance in most of the lake-containing swamps, but, as is well-known, is not confined to them. It is also an important moor builder.

Two species of Epilobium are confined to the moors—*E. lineare* and *E. strictum.*

Proserpinaca palustris must also be included here.

The *Ericaceæ* is one of the three most conspicuous orders in the moors. The other two are the sedges and the orchids.

The species here which are exclusively moor plants are: *Ledum Groenlandicum, Kalmia glauca, Andromeda polifolia, Chamædaphne calyculata, Chiogenes hispidula, Schollera oxycoccus* and *S. macrocarpa.* Many others, especially species of Vaccinium, live in the moor, but are not confined to them.

Menyanthes trifoliata is a moor plant, and is not uncommon in our region.

The *Lentibuliariaceæ* contribute to this group *Utricularia cornuta, U. gibba, U. intermedia* and *U. resupinata,* all of which are rare plants and grow only in the newer portions.

In the order *Compositæ,* but three species can lay claim to being exclusively moor plants. These are *Solidago ohioensis, S. uliginosa* and *Aster junceus.*

THE FLORA OF THE WOODED BELT.

The third zone of the whole swamp is still to be considered. To attempt to enumerate the species as has been done in the case of the bog and the lake would contribute little to our picture of the swamp as a whole. The species are, for the most part, the same as may be found upon the surrounding uplands, especially in low places. In fact, we may say that just as the moor is steadily invading the lake, so the wooded belt is invading the moor, and there is by no means the sharp limitation to the outer edge of the wooded belt that there is to the outer edge of the moor or of the lake. It is always a tree-covered tract in the natural state, the size of the trees increasing as one passes from the edge of the moor to the hard shore. The trees which appear most frequently are *Ulmus americana, Acer saccharinum, Fraxinus nigra, Pinus strobus, Thuya occidentalis, Larix laricina, Picea mariana* and *Betula lenta.* Of these the predominating species are the first three or four. Shrubs are more abundant in the more open portions near the moor. *Lindera Benzoin, Ilex verticillata, Ilicioides mucronata* and several species of *Vaccinium* are the most prominent. The herbaceous the wooded belt is not a very rich one. Caltha often covers flora of the ground. The most prominent plants are the Osmundas, which grow in rank profusion. *Smilax hispidia, Arisæma triphyllum, Dalibarda repens, Trientalis americana, Medeola vir-*

giniana and many others also grow here. As might be expected, it is a flora made up of species which are by no means confined to this particular place. Some of them flourish equally well upon the surrounding uplands; a few grow in the open moor; many grow in low grounds that do not have the vegetable accumulations characteristic of these swamps.

THE DISAPPEARANCE OF SPECIES WITH THE MATURING OF THE BOG.

The rareness of some of the bog plants attest the gradual disappearance of species from these places. Specimens of *Listera australis* were found by Father Wibbe at the Lily Marsh in New Haven in 1877, where he reported it as growing abundantly.[2] The writer has visited the same place several times since 1888, and has failed to find it again. It is safe to say that it is not abundant there now. A few plants were found by the writer in "Granny's Orchard," in Palermo, in 1895. Here continued and careful search resulted in the finding of but a few plants. Dr. W. M. Beauchamp has found the same species growing at Mud Lake near Baldwinsville, Onondaga County. Here, too, only a few specimens were found. These are, so far as known, the only stations for this species north of New Jersey. It is significant that a considerable number of species, not only those that affect bogs, but some Upland ones, have the same general range as *Listera australis*. The most conspicuous of these are: *Rhexia virginica, Nyssa aquatica, Eriocaulon septangulare, Triglochin maritima, Xyris montana, Scheuchzeria palustris* and several of the *Utricularias*. It seems a reasonable inference that formerly there existed in these regions conditions much more congenial to these plants; that then they were more abundant and continuous in their range than now, and that they have settled in the limited tracts which afford them a congenial home. The conditions which conduce to their persistency are no doubt complex. The main ones, however, seem to be a constant and abundant humidity in the air and abundant moisture in the soil, and, at the same time, a relatively even temperature throughout the year. Humidity in the air is maintained by the extensive surface of the sphagnous moss from which it steadily evaporates great quantities of water. Many plants, especially the delicate orchids, are found only in the moss. The humidity of the air immediately at the surface of the moss at once suggests the conditions in the tropics where the epiphytic orchids thrive.

---

[2] Bull. Torr. Bot. Club, VI, 192.

COMMERCIAL VALUE OF THE BOGS.

The capacity of the moss to hold moisture and the evenness and freedom with which it gives it up, has led to its extenstve use in packing the roots of plants during shipment. In the Lily Marsh and Mud Lake in Oswego township, the moss has been removed from a large part of the moors. The effect upon the bog itself is anything but wholesome. By this treatment a clean, mossy moor is turned into a stinking, sour, unsightly and treacherous mud-hole. Nowhere did I ever see such violence done to nature as where the moss is removed from a moor. The traditional woodman's axe does not compare; a burnt forest soon recovers itself to a certain extent; but a bog from which the moss has been taken reclothes itself very slowly, and will probably never become a thick turf as originally. Certainly none of the rarer plants will endure such treatment.

CONCLUSIONS.

1. Swamps form one of the striking and important topographical features of Oswego County.

2. These may consist of a lake, a moor and a wooded belt but in many the lake has been converted into a moor, and in others both lake and moor have passed over into wooded tracts.

3. The surface of the county was fluted by the ice; this determines the outline of all the swamps.

4. The finely pulverized remains of plants (mud) are stirred up with every wind, so that material is constantly shifted from the muddy shores to deeper water.

5. The agitation of the water by the wind has two important influences on the shore: its violence prevents sphagnum from growing at the water's edge; Cassandra, sedges and Decodon, with others, form a barrier at the edge; second, it pre-

vents plants from gaining a foot-hold on the eastern shores where the lakes are of considerable size.

6. The flora of the moor has among its species some of the rarest plants of the region.
7. A considerable number of species otherwise confined to the Atlantic coast occur here. It does not follow, as Paine asserts (l. c., p. 92), that a maritime bay occupied this depression.
8. The distribution of moor-loving plants suggests that once conditions of humidity and temperature enabled them to grow very much more abundantly than now.
9. The commercial value of the moss bids fair to devastate the moors, and their recovery will, of necessity, be very slow.

EDITOR'S TABLE.

With the present number the AMERICAN NATURALIST comes into the possession of new proprietors and under the charge of new editors. We do not propose to make promises of improvement; but shall leave the journal to speak for itself upon that score. We do think it due to our readers, however, to state our convictions as to the position the NATURALIST should occupy in the future.

As we see it, there are, under existing conditions in science, only three kinds of scientific serials that can hope to prosper. There is, on the one extreme, the technical journal devoted to a single strictly defined subject and intended as a repertory of the results of research. At the other extreme is the popular scientific journal which seeks to interest and instruct those who are without specific scientific training. Lastly, between these extremes, comes the general scientific journal which holds a distinct position; it is intended for the students and workers in science—a constituency which has already attained considerable size in this country and is rapidly growing. The NATURALIST aims at being such a journal with such a constituency.

The objection may be made, however, that this constituency is an ill defined one and is without common needs. There are two answers to this objection; the *á priori* answer and that of experience. The *á priori* answer is that, despite the fact that science is becoming more differentiated, its separate disciplines are expanding and coming to